REMARKS

Reconsideration of this application in light of the above amendments and the following remarks is requested. Applicants appreciates the Examiner's indication of allowable subject matter in claims 2, 4, 5, 7-11, 13-17, 23-45, 47 and 48. Instead of amending the claims, all prior claims have been canceled in favor of newly added claims 49-67 that take into consideration the Examiner's indicated allowable subject matter.

Objections to the Claims

The Examiner's objections to claims 2-15 are now moot due to the cancellation of these claims.

Rejections Under 35 U.S.C. §103

The Examiner rejected various claims under 35 U.S.C. §103(a) over the combinations of Pheng and Kinard, and also over Pheng, Kinard and Hyodo. Applicants wish to address the Examiner's application of these references to the claims.

Pheng is directed to a method that subjects a microemulsion material to a first thermal treatment and then a second thermal treatment, as shown in steps 302 and 304 in Fig. 3. In rejecting the claims, the Examiner stated that "Kinard...discloses a step of reducing a lower dielectric material with better mechanical stability in the process" and referenced Col. 4, lines 45-59 thereof. However, a careful reading of Kinard at the specified locations yields the following:

> To minimize problems that would otherwise be generated during use of the finished device at the interface between the heated material of the heater element and the silicon surface contacted thereby and regions immediately surrounding the heater, the present invention thus employs a low-stress, multifilm, composite membrane which has both a high thermal efficiency and high mechanical stability. The SiO_3-Si_3N_4-SiO_2 sequence ***provides lower dielectric loss*** than SiN_4-SiO_2-Si_3N_4, and therefore better electrical performance of the heater, and reduces the risk of surface cracks due to defects. (emphasis added)

Applicants respectfully submit that the text "***provides lower dielectric loss***" in Kinard is NOT "***producing a lower dielectric material*** with better mechanical stability" of the independent claims. Kinard does not describe the step of producing a lower dielectric material with better mechanical stability, but merely comparing two materials, where one has the characteristics of lower dielectric loss. Lower dielectric loss is NOT equivalent to lower dielectric material. Therefore, even when combined, the references do not teach or suggest the claimed limitations.

Further, there is no motivation to combine Pheng and Kinard in the manner suggested by the Examiner. There is no reason given or suggested for Kinard to treat the SiO_3-Si_3N_4-SiO_2 sequence which ***provides lower dielectric loss*** with the two step treatment method of the claims. Kinard is also clearly nonanalogous art since it is directed to a multilayer thin film multi-junction integrated micro-potentiometer for the measurement of AC and RF voltage. Therefore, Applicants respectfully submit that Kinard is improperly combined with Pheng and with Pheng and Hyodo in forming the rejections under 35 U.S.C. §103(a). Although the original claims have been cancelled, because the same or similar language is used in some of the new claims, Applicants wish to point out the improper manner in which the references are combined to form the basis of the rejections.

New Claims

New independent claim 49 has been added. Claim 49 cites,

> An integrated method comprising:
>
> providing a low dielectric material;
>
> applying a first treatment altering a first property of the low dielectric material, the first treatment being a treatment other than a thermal treatment; and
>
> applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability.

Claim 49 provides for a method that has two treatments, the first of which is not a thermal treatment. Pheng is directed to a method using two thermal treatment steps. As discussed above, Kinard does not adequately fill the void of "producing a lower dielectric material with better mechanical stability. Hyodo also does not teach or suggest a two step treatment process. Therefore, new claim 49 is patentable over the art of record.

New claim 50 is dependent from claim 49 and cites, "wherein applying a first treatment comprises subjecting the low dielectric material to a treatment selected from a group consisting of hydrogen-based plasma, electron beam, ultraviolet radiation, and microwave hydrogen plasma." This has been indicated by the Examiner as allowable subject matter.

New claim 51 is dependent from claim 49 and cites, "wherein applying a second treatment comprises subjecting the low dielectric material after the first treatment to a treatment selected from a group consisting of hydrogen-based plasma, electron beam, ultraviolet radiation, and carbon-based plasma, microwave hydrogen plasma." This also has been indicated by the Examiner as allowable subject matter.

New independent claim 52 has been added. Claim 52 cites,

> providing a low dielectric material;
>
> applying a first treatment altering a first property of the low dielectric material; and
>
> applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability, the second treatment being a treatment other than a thermal treatment.

Claim 52 provides for a method that has two treatments, the second of which is not a thermal treatment. Pheng is directed to a method using two thermal treatment steps. Further, the combination of Kinard and Pheng does not teach or suggest "producing a lower dielectric material

with better mechanical stability. Hyodo also does not teach or suggest a two step treatment process. Therefore, new claim 52 is patentable over the art of record.

New claim 53 is dependent from claim 52. Claim 53 is also directed to a method "wherein applying a first treatment comprises subjecting the low dielectric material to a treatment selected from a group consisting of hydrogen-based plasma, electron beam, high temperature, ultraviolet radiation, and microwave hydrogen plasma." None of the art of record teach or suggest these limitations. Claim 53 is therefore also patentable.

New claim 54 is dependent from claim 52. Claim 54 is also directed to a method "wherein applying a second treatment comprises subjecting the low dielectric material after the first treatment to a treatment selected from a group consisting of hydrogen-based plasma, electron beam, ultraviolet radiation, and carbon-based plasma, microwave hydrogen plasma." None of the art of record teach or suggest this step. Claim 54 is therefore also patentable.

New claim 55 is an independent claim that cites,

> providing a low dielectric material;
>
> applying a first treatment altering a first property of the low dielectric material, the first treatment treating the low dielectric material with ***hydrogen-based plasma***; and
>
> applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability. (emphasis added)

The first treatment of new claim 55 is specifically provided as being a hydrogen-based plasma treatment step. Pheng teaches only a method with two thermal treatment steps. Kinard in combination with Pheng does not teach or suggest the claimed method, and the Pheng-Kinard-Hyodo combination also does not teach or suggest all of the limitations in new claim 55. Therefore, claim 55 is allowable.

New claim 56 depends from claim 55 and cites "wherein applying the second treatment comprises treating the low dielectric material with microwave hydrogen plasma." New claim 57 also depends from claim 55 and cites, "wherein applying the second treatment comprises treating the low dielectric material with ultraviolet radiation." None of the combinations of Pheng-Kinard and Pheng-Kinard-Hyodo teach or suggest these limitations. Therefore, claims 56 and 57 are allowable.

New independent claim 58 cites:

> providing a low dielectric material;
>
> applying a first treatment altering a first property of the low dielectric material, the first treatment treating the low dielectric material with ***ultraviolet radiation***; and
>
> applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability. (emphasis added)

The first treatment of new claim 58 is specifically provided as a treatment using ultraviolet radiation. Pheng teaches a method with two thermal treatment steps. Kinard in combination with Pheng does not teach or suggest the claimed method, and the Pheng-Kinard-Hyodo combination also does not teach or suggest all of the limitations in new claim 58. Therefore, claim 58 is allowable.

Claim 59 is a new claim depending from claim 58. Claim 59 cites, "wherein applying the second treatment comprises treating the low dielectric material with carbon-based plasma." New claim 60 also depends from claim 58 and cites, "wherein applying the second treatment comprises treating the low dielectric material with hydrogen plasma." None of the art of record teach or suggest these limitations. Claims 59 and 60 are therefore also patentable.

Independent claim 61 has been added to provide for:

> providing a low dielectric material;

applying a first treatment altering a first property of the low dielectric material, the first treatment treating the low dielectric material with ***microwave hydrogen plasma***; and

applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability.

None of the art of record either alone or in combination teach or suggest all of the limitations in claim 61. Claim 61 is therefore patentable.

Claims 62 and 63 both depend from claim 61 and provide the additional limitations of treating the low dielectric material with carbon-based plasma and hydrogen plasma, respectively. None of the art of record either alone or in combination teach or suggest these limitations. Claims 62 and 63 are therefore patentable as well.

New claim 64 is another independent claim and sets for that the method with first and second treatments of the low dielectric material, "one of the first and second treatment comprises treating the low dielectric material with a plasma." None of the references Pheng, Kinard, and Hyodo in combination or by themselves teach these limitations. Applicants therefore respectfully submit that new claim 64 is allowable.

New claim 65 is another independent claim and sets for that the method with first and second treatments of the low dielectric material, "one of the first and second treatment comprises treating the low dielectric material with ultraviolet radiation." None of the references Pheng, Kinard, and Hyodo in combination or by themselves teach these limitations. Applicants therefore respectfully submit that new claim 65 is allowable.

New claim 66 is another independent claim and sets for that the method with first and second treatments of the low dielectric material, "one of the first and second treatment comprises treating the

low dielectric material with an electron beam." None of the references - Pheng, Kinard, and Hyodo - in combination or by themselves teach these limitations. Applicants therefore respectfully submit that new claim 66 is allowable.

Claim 67 has been added. Independent claim 67 cites,

> providing a low dielectric material;
>
> applying a first treatment altering a first property of the low dielectric material, the first treatment treating the low dielectric material with ***high temperature***; and
>
> applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability, the second treatment treating the low dielectric material with ***a plasma***. (emphasis added)

None of the art of record either alone or in combination provides teaching or suggestion for all of these limitations. Independent claim 67 is therefore also allowable.

Conclusion

It is clear from all of the foregoing that independent claims 49, 52, 55, 58, 61, 64-67 are in condition for allowance. Dependent claims 50, 51, 53, 54, 56, 57, 59, 60, 62, and 63 depend from and further limit the independent claims and therefore are allowable as well.

An early formal notice of allowance of claims 49-67 is respectfully requested.

The Director is hereby authorized to charge any fees which may be required or credit any overpayment to Deposit Account Number 08-1394.

Respectfully submitted,

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Dated: July 8, 2005

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July 8, 2005

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